

**ABSTRACT OF THE DISCLOSURE**

The present invention relates generally to a mathematical and computer model of diabetes related disorders (e.g., human type 2 diabetes) within the framework of multiple macronutrient metabolism. The model includes a representation of complex physiological control mechanisms directing, for example, fat metabolism, protein metabolism and/or carbohydrate metabolism. In one embodiment, for example, the model can account for the interconversion between macronutrients, as well as their digestion, absorption, storage, mobilization, and adaptive utilization, as well as the endocrine control of these processes. In this embodiment, the model can simulate, for example, a heterogeneous group of diabetes related disorders, from insulin resistant to severe diabetic, and can predict the likely effects of therapeutic interventions.